Claims

1. A turbo engine (1) comprising rotor blades (4) made of an electrically conducting material having an electrically insulating surface (5), said blades being arranged on a rotor shaft (3) that is rotatably mounted in a housing (2), the electrically conducting material of the rotor blades being electrically connected to a reference potential, said turbo engine comprising at least one measuring element (6), arranged in the region of the rotor blades (4), for measuring an electric and/or magnetic field strength set up by a charge distribution on the surface (5) of the rotor blades (4).

2. A turbo engine (1) comprising rotor blades (4) arranged on a rotor shaft (3) that is rotatably mounted in a housing (2), and comprising rotationally fixed guide blades (7) made of an electrically conducting material having an electrically insulating surface (8), the electrically conducting material of the guide blades (7) being electrically connected to a reference potential, said turbo engine comprising at least one measuring element (9) arranged on the rotor shaft (3) in the region of the guide blades (7), for measuring an electric and/or magnetic field strength set up by a charge distribution on the surface (8) of the guide blades (7).

3. The turbo engine (1) as claimed in claim 2, wherein the rotor blades (4) are made of an electrically conducting material having an electrically insulating surface (5), the electrically conducting material of the rotor blades (4) being electrically connected to a reference potential, and wherein at least one measuring element (6), arranged in the region of the rotor blades

(4), is provided for measuring an electric and/or magnetic field strength set up by a charge distribution on the surface of the rotor blades.

4. The turbo engine as claimed in one of the claims 1 to 3, wherein at least one measuring element (6, 9) is formed by a coaxial antenna.

5. The turbo engine as claimed in one of the claims 1 to 4, wherein at least one measuring element (6, 9) can be connected to a measuring unit (10).

6. The turbo engine as claimed in claim 5, wherein the measuring unit (10) contains a monitoring unit (11).

7. The turbo engine as claimed in claim 5 or 6, wherein the measuring unit (10) has a communication link to a control center (12).

8. The turbo engine as claimed in claim 6 or 7, wherein the monitoring unit (11) comprises a signaling and/or an alarm device (14).

9. The turbo engine as claimed in one of the claims 6 to 8, wherein the turbo engine (1) can be shut down by the monitoring unit (11).

10. The turbo engine as claimed in one of the claims 1 to 9, wherein the electrically insulating surface (5, 8) is formed by a coating.

11. The turbo engine as claimed in one of the claims 1 to 10, wherein the turbo engine (1) is a turbine, in particular a gas turbine.

12. A method for determining damage to an electrically insulating surface (5) of at least one rotor blade (4) in a turbo engine (1), said blade being made of an electrically conducting material and arranged on a rotor shaft (3) that is rotatably mounted in a housing (2), wherein an electric and/or magnetic field strength set up by a charge distribution on the surface (5) of the at least one rotor blade (4) is measured by means of at least one measuring element (6), and a deviation from a definable threshold value (15) is determined.

13. A method for determining damage to an electrically insulating surface (8) of at least one guide blade (7) in a turbo engine (1), said blade being made of an electrically conducting material and rotationally fixed in a housing (2), said turbo engine also comprising in the housing (2) rotor blades (4) arranged on a rotatably mounted rotor shaft (3), wherein an electric and/or magnetic field strength set up by a charge distribution on the surface (8) of the at least one guide blade (7) is measured by means of at least one measuring element (9) arranged on the rotor shaft (3) in the region of the guide blades (7), and a deviation from a definable threshold value (15) is determined.

14. The method as claimed in claim 12 or 13, wherein the deviation is transmitted to a control center (12).

15. The method as claimed in one of the claims 12 to 14, wherein an alarm is output when the threshold value (15) is exceeded.

16. The method as claimed in one of the claims 12 to 15, wherein the turbo engine (1) is shut down when the threshold value (15) is exceeded.

17. The method as claimed in one of the claims 12 to 16, wherein the measurement signal supplied by the at least one measuring element (6, 9) is transformed, in particular by a Fourier transformation, by means of a measuring unit (10).

18. The method as claimed in claim 17, wherein a FFT transformation unit (16) is used.

19. The method as claimed in claim 17 or 18, wherein the result of the transformation is displayed and/or signaled.

20. The method as claimed in one of the claims 17 to 19, wherein the result of the transformation is compared with a definable threshold value (17).